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EDITORIAL.

Tea Production in Malaya.

The article on the Malayan Tea Industry in 1938, which is included in this number, summarizes available information on this subject. The development of the industry over the past few years proves that the confidence of the Department of Agriculture and of capitalists in the possibility of profitable investment in tea cultivation was justified.

We are aware of the difficulty experienced by the planter during the past year or so in laying down a development programme for the next few years. The root of this difficulty lies in the uncertainties connected with tea restriction. The first tea restriction scheme, of which Malaya was a partner, terminated at the end of March 1938, since when negotiations between this country and the International Tea Committee have proceeded, but have not yet resulted in a settlement. During this interregnum it has been impossible for the Tea Controller to issue licences to plant in excess of the total area previously agreed upon by this Government and the Committee. Under the circumstances the Tea Controller appears to have had no alternative, for the issue of further licences to plant would have prejudiced any new Agreement, and would have been against the principle of friendly co-operation between countries which are interested in the tea industry.

While, however, no new licences to plant will be issued, the Tea Controller, at the beginning of 1939, extended for a period of three months the licences to plant during 1938. In view of the very unfavourable planting season experienced in the latter part of 1938, this concession was most acceptable to the industry. Planting conditions during the first quarter of 1939 were little better, in consequence of which all licences to plant tea, which normally expired at the end of last year will remain valid till the end of June 1939.

Negotiations between this country and the Internationel Tea Committee were opened some time before the first Agreement terminated, but after some months produced no agreement. The Malayan Government then invited the United Planting Association of Malaya to form a Tea Committee and to appoint a representative in London to re-open negotiations with the International Tea Committee. The Association accepted this suggestion and Sir John Hay agreed to negotiate with the Committee on behalf of the Association.

Sir John Hay has an intimate knowledge of the industry in Malaya and is therefore fully competent to present Malaya's case with ability and conviction The tea industry in this country may therefore rest assured that the terms of agreement which he will eventually recommend for acceptance will be the most favourable possible for Malaya.

It is possible that further time may elapse before the terms of the new Agreement have been formally accepted by the other countries concerned. In view of this inevitable delay it has appeared desirable to the Tea Controller, F.M.S. and S.S., to allow the planting, under licences, of tea nurseries in the current rainy season by such companies or individuals as may desire to make an early start when agreement on Tea Regulation has been finally reached.

Persons desiring to plant tea nurseries in the F.M.S. or S.S. before 31st May 1939 are invited to apply to the Tea Controller, Department of Agriculture, Kuala Lumpur, for licences to plant. Proof of ability to secure seed will be required before licences are issued. It is to be understood that licences issued for small nursery areas will give no claim to subsequent licences for planting in the field. Licences for other than small nursery areas will not be issued until the completion of negotiations now in progress with the International Tea Committee. Forms of application may be obtained from the Tea Controller.

The Malayan Pineapple Industry.

During the Great War the exports of Malayan canned pineapples, which previously had exceeded 20,000 tons a year, declined to a mere 3,500 tons, but from 1919 the industry steadily expanded, until in 1937 the exports exceeded 80,500 tons, valued at over one million sterling.

The growth of the industry, however, was rather haphazard, due in a large measure to the fact that the pineapples were grown as a catch crop with young rubber, in consequence of which the canning industry did not bear the stamp of permanency. Grown as a catch crop the cost of production was so low that Malaya was able to create a demand and to market the produce at a cost which at that time defied competition.

During the past few years competition has become keener, the competition not only of canned pineapples from other regions, but of a wide range of canned fruits, and also of fresh fruit from various parts of the world transported under controlled storage conditions.

Lack of organization within the industry precluded adequate steps being taken to maintain and extend the market for the Malayan product. The world-wide trade depression rendered the position even more difficult and served to demonstrate still more clearly the urgency of re-organization within the industry. Eventually a point was reached where the price of the canned product was below cost of production and where large unsold stocks accumulated.

The possibility that some such situation would arise was visualized at least 10 years ago and resulted in a Pineapple Conference in Singapore in 1930 when an attempt was made to clarify ideas on the industry and to initiate improvements with the object of placing the industry on a sound financial basis.

Unremitting efforts in this direction have continued, and it would appear that the present organization of the canning industry, supported as it is by legislation, has at least laid the foundation of a new era of prosperity.

The Department of Agriculture is actively concerned with the operation of the legislation and the conduct of the Central Board of Pineapple Packers, Malaya, which has recently been formed. The Department is also developing research work on cultural problems and has commenced investigations on canning operations. The growing importance of the industry now justifies the regular issue of intelligence notes. A "Quarterly Report on the Malayan Pineapple Industry" has been established and will in future be regularly published in this journal. The Department has also developed a service whereby the Malayan pineapple industry will be kept fully informed, by means of a "Quarterly Summary of Miscellaneous Information on Pineapples" of developments in the pineapple industry in other countries.

The Malayan pineapple industry appears to have set about in earnest to put its house in order. We believe that although many difficulties will yet confront the industry, with the improved organization already initiated and which we hope will eventually be strengthened by embracing all branches of the trade—growers, canners and exporters—one may confidently anticipate that it will be possible to weather all storms and to establish the reputation of Malayan canned pineapples on the world's market as a cheap, wholesome fruit of unquestioned quality.

Original Articles.

THE MALAYAN TEA INDUSTRY IN 1938

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Prices.

The wholesale price of tea, not only of Malayan origin, but from most tea producing countries, was on a lower level during 1938 than in the previous year. Table I shows the average monthly prices obtained for Malayan tea on the London market, and for purposes of comparison, the prices obtained on that market for tea from other countries.

Table I.
London Prices of Tea.

per lb.

1938	Malayan				Ceylon	Java	India North	India South	Sumatra
	Number of Packages		Prices						
	Upland	Lowland	Upland	Lowland					
			s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	282	390	1 2.17	1 1.25	1 3.52	1 0.72	1 2.07	1 2.24	11.54
February	288	299	1 2.08	1 1.00	1 4.59	1 0.48	1 2.14	1 2.72	11.49
March	100	202	1 2.88	1 1.25	1 4.87	1 0.92	1 1.84	1 3.68	11.93
April	324	533	1 2.56	1 1.04	1 4.17	1 2.56	1 2.04	1 3.81	11.68
May	72	361	1 3.00	1 0.75	1 3.22	1 1.82	1 2.22	1 2.81	1 0.09
June	330	625	1 1.94	1 0.25	1 2.34	1 0.56	1 1.81	1 1.72	11.06
July	144	491	1 2.00	11.75	1 2.35	11.96	1 1.34	1 0.95	10.79
August	384	360	1 1.44	11.90	1 2.78	1 0.32	1 3.61	1 0.88	10.99
September	198	370	1 1.62	11.64	1 4.04	1 1.77	1 3.77	1 1.31	11.06
October	494	454	1 2.15	1 0.00	1 3.18	1 4.20	1 2.58	1 1.47	1 0.05
November	186	219	1 1.88	1 0.00	1 2.47	1 0.88	1 1.46	1 1.14	11.14
December	348	327	1 2.08	11.38	1 3.14	11.83	1 0.99	1 1.63	10.40
	3150	4631							

The average prices per lb. of Malayan tea on the London market during 1938 were: Upland 1s.2.15d., Lowland 1s.0.46d. Weighted average London prices for tea from other countries were as follows:—Ceylon 1s.3.34d., Java 1s.0.85d., India North 1s.2.24d., India South 1s.1.84d., Sumatra 11.28d. Average prices (unweighted) in 1937 were:—Malayan upland 1s.2.9d., Lowland 1s.1.7d., Ceylon 1s.4.00d., Java 1s.1.76d., India North 1s.3.05d., India South 1s.2.69d., Sumatra 1s.0.20d.

The range of prices per lb. of Malayan tea on the London market was:—Upland 1s.3¼d. to 1s. 1¼d.; Lowland 1s.2d. to 11d., as compared with 1s.3¾d. to 1s.1d. and 1s.3d. to 11¾d. in 1937.

The Tea Agreement.

Under the first International Tea Agreement, which terminated on 31st March 1938, Malaya undertook that the area planted between the end of 1936 (when Malaya entered the Agreement) and the 31st March 1938, should not exceed 3,000 acres, or that the actual planted area in the country should not exceed 6,000 acres. Owing, however, to the short time available, the amount actually planted from 1st January 1937 to 31st March 1938 was only 1,272 acres, making the total planted area 4,716 acres on the latter date.

When the terms for a new Agreement to start on April 1st 1938 came to be considered the Malayan Government demanded that Malaya should be allowed to plant up to a total of at least 10,000 acres in all by the end of the second Agreement, *i.e.* by 31st March, 1943. The International Tea Committee, after first proposing that there should be no increase at all beyond the 6,000 acres allowed under the first Agreement, eventually made an offer of 7,000 acres as the total to be allowed by the end of the second Agreement.

The United Planting Association of Malaya approached the Government, stating that it considered that the minimum demand should be for 15,000 acres over and above whatever the area actually planted might be on 31st March 1938, *i.e.* roughly a total of 20,000 acres by March 1943.

The Government asked the United Planting Association to form a Tea Planters' Section or Committee to conduct future negotiations with the International Tea Committee, appointing its own representative in London for the purpose. The United Planting Association of Malaya agreed to this course and duly formed a Committee and appointed Mr. J. G. Hay (now Sir John Hay) to act as their representative.

In asking an unofficial body to conduct the negotiations, the Government merely conformed to the procedure of other tea growing countries, for the preliminary negotiations between the important tea growing countries and the International Tea Committee (itself an unofficial body) were conducted by representatives of the Tea Planters' Associations of those countries, so that in due course agreed proposals were submitted to the Governments concerned for consideration.

At the time of writing, no agreement between the Malayan representative and the International Tea Committee has been announced, a delay which although unavoidable, has curtailed natural development in this country.

During the negotiations, the Tea Controller, in order that planting should not be held up, and also in view of the desirability of clearing being carried out at an early date in order to provide employment, favourably considered suitable applications to plant during 1938. The licences to plant during 1938 were extended to the end of March 1939 because of the unfavourable planting weather experienced during the latter part of 1938.* Licences to plant issued since 1st April 1938 covered 1,934 acres, of which 1,197 acres had been planted by the end of the year.

Area under Tea.

The total area planted with tea in Malaya, showing years of planting, is given in Table II. It will be noted that the figures for the years before 1938 differ slightly from those given in the review of the industry for 1937.† The present figures are compiled from questionnaires sent to all estates at the end of 1938, and may therefore be considered as the more accurate. In addition, the area of tea planted on small holdings in the lowlands is estimated as in 1937 to be 559 acres, distributed as follows:—Johore 49 acres, Selangor 460 acres, Negri Sembilan 32 acres, Perak 6 acres, Pahang 5 acres, Penang 2 acres, Malacca 4 acres, Province Wellesley 1 acre.

With the exception of one small area, the upland tea is all situated at Cameron Highlands.

Table II
Area Planted with Tea, Malaya.

(Estates only, showing years of planting)

Acres

	Before 1930	1930	1931	1932	1933	1934	1935	1936	1937	1938	Total Area	Reserve Land
Upland Estates	98	325	164	86	43	52	269	336	613	1,237	3,223	4,900
Lowland Estates	1,087	188	63	6	—	6	81	88	175	682	2,376	2,216
TOTAL	1,185	513	227	92	43	58	350	424	788	1,919	5,599	7,116

* The licences to plant have since been extended to the end of June 1939.

† *Malayan Agricultural Journal*, Vol. XXVI No. 4.

The total area under tea, therefore, at the end of 1938 is estimated at 6,158 acres (estates 5,599 acres, small holdings 559 acres). The area of reserve land held by registered estates is estimated at 7,116 acres. It is probable, however, that the actual area of land available for tea planting is greater than this figure, as there may be areas of land alienated for tea planting for which the owners have made no application to plant, and other areas alienated under conditions which do not preclude the cultivation of this crop.

At the end of 1937, the area planted was stated to be 4,245 acres, comprising 2,041 acres upland tea, 1,645 acres lowland tea and 559 acres small holdings, and the reserve land was estimated at 6,404 acres.

Production.

The estate production of tea in 1938 amounted to 1,217,306 lbs. as compared with the estimate of 1,250,000 lbs.* The actual production was 507,654 lbs. upland and 709,652 lbs. lowland, and the estimate was 449,000 lbs. upland and 803,000 lbs. lowland. Thus, while the actual production was very close to the approximation, it would appear that production of tea per acre on upland estates may be greater than the present generally accepted figures, and lowland production rather less than anticipated.

The production of tea on small holdings is unknown, but judging by an inspection of the condition of most of these areas, it is probably in the region of 450 lbs. per acre, giving, for the year 1938, a production from this source of 250,000 lbs., and a total production for Malaya of 1,467,306 lbs. as compared with 1,251,071 lbs. in 1937. The annual production of tea on estates is shown in Table III. This table also shows that exports of Malayan tea in 1938 were 747,303 lbs. and sales for consumption in Malaya 434,624 lbs. Small-holding tea is also consumed locally, so that the "final" figures are:—exported 747,303 lbs., locally consumed 684,624 lbs.

Table III.
Malayan Production and Exports of Tea.

(Estates only)
in lbs.

Year	Upland			Lowland			Total		
	Produced	Exported	Sold Locally	Produced	Exported	Sold Locally	Produced	Exported	Sold Locally
1930	—	—	—	95,040	35,730	59,310	95,040	35,730	59,310
1931	—	—	—	127,988	31,000	95,662	127,988	31,000	95,662
1932	4,382	—	3,161	138,694	16,472	123,101	143,076	16,472	126,262
1933	39,440	6,990	29,958	172,449	59,952	118,997	211,889	59,942	148,955
1934	115,874	44,072	64,510	228,497	74,843	152,789	344,371	118,915	217,299
1935	212,927	163,787	30,431	418,735	238,189	173,583	631,662	401,976	204,014
1936	327,796	253,308	79,162	616,970	397,074	210,788	944,766	650,382	289,950
1937	373,767	183,026	182,431	627,304	400,026	229,113	1,001,071	583,052	411,544
1938	507,654	292,296	198,978	709,652	455,007	235,646	1,217,306	747,303	434,624

* *Malayan Agricultural Journal*, Vol. XXVI, No. 4, page 158.

Consumption.

As stated above, the total consumption of locally-produced tea in 1938 was 684,624 lbs., as compared with 661,544 lbs. in 1937. In addition, net imports of tea during the year under review were 3,465,916 lbs., against 4,880,627 lbs. in 1937, giving a total consumption of tea in Malaya during 1938 of 4,150,540 lbs. as compared with 5,542,171 lbs. in 1937. The detailed figures and values of annual tea imports are shown in Table IV.

The Malayan population at the end of 1938 was estimated to be 5,278,866 persons, so that the consumption of tea in 1938 was a little over $\frac{3}{4}$ lb. per head.

No information of stocks of tea carried by dealers from one year to another is available, so that figures of total consumption in any one year must be treated as only approximately correct. There is little doubt, however, that consumption during the past few years has been of a lower order than for years previous to 1932, doubtless due to the changed economic condition of the inhabitants.

Table IV.
Net Imports of Tea into Malaya.

Year	Black		Green		Total Net Imports.	
	Quantity lbs.	Value $	Quantity lbs.	Value $	Quantity lbs.	Value $
1923 ...	—	—	—	—	6,828,977	2,391,264
1924 ...	—	—	—	—	7,176,274	2,783,349
1925 ...	—	—	—	—	7,825,840	3,138,327
1926 ...	—	—	—	—	9,664,809	3,947,613
1927 ...	—	—	—	—	9,539,195	4,041,901
1928 ...	—	—	—	—	8,647,440	3,769,141
1929 ...	—	—	—	—	10,152,422	3,885,275
1930 ...	—	—	—	—	8,732,453	2,872,220
1931 ...	—	—	—	—	6,845,748	1,665,644
1932 ...	3,498,909	725,119	944,474	290,450	4,443,383	1,015,569
1933 ...	2,404,482	537,059	836,135	317,091	3,240,617	854,150
1934 ...	3,264,661	764,634	1,177,582	472,211	4,422,243	1,236,845
1935 ...	2,674,599	717,118	1,384,957	507,068	4,059,556	1,224,186
1936 ...	2,307,188	408,769	1,587,405	498,135	3,894,593	906,904
1937 ...	2,709,302	440,905	2,171,325	625,962	4,880,627	1,066,867
1938 ...	2,170,856	445,939	1,295,060	332,145	3,465,916	778,084

Imports of black and green tea were not shewn separately before 1932.

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VARIATION IN TOXIC CONTENT OF ROOTS OF *DERRIS MALACCENSIS* VAR. *SARAWAKENSIS* WITH INCREASE IN AGE OF PLANTS

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Introductory.

An account was given in a previous number of this Journal(1) of a small-scale experiment carried out at the Central Experiment Station, Serdang, with the object of determining the optimum period of harvesting plants of *Derris malaccensis* var. *sarawakensis* from the point of view of maximum toxic content of root as judged by the ether extract.

The results of that experiment, which covered a period from 19 to 27 months, showed that the ether extract increased gradually to a maximum at 23 months. After this there was a steady decline as the plants increased with age.

In view of the wide variation found in the ether extract of roots from individual plants of *D. malaccensis* var. *sarawakensis* in the original Derris selection experiments(2) and the fact that the original determinations were made on small samples of root the experiment has been repeated on a larger scale at Serdang.

Lay-out of Experiment.

The site chosen for the experiment was in Field 14.

The soil may be described as a dark yellowish-grey loam containing about 50 per cent. fine fractions.

The area was divided into 12 plots. Each plot measured 35 ft. x 39 ft. equivalent to approximately 1/32nd acre.

The plots were isolated by paths 6 ft. in width to prevent roots from one plot entering another.

A plan of the experiment is shown in Diagram I.

The cuttings were taken from a mixed population of plants and were randomized before planting.

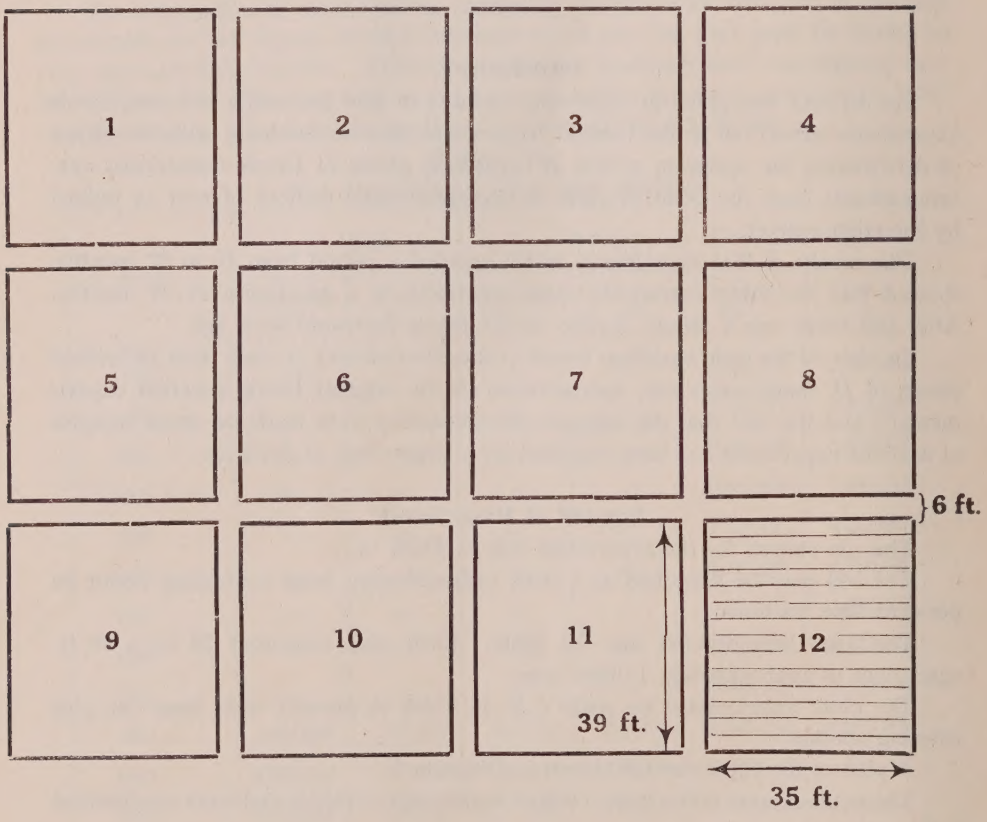
The cuttings were set in rows 3 ft. apart with the same distance between the cuttings in each row. There were 13 rows in each plot with 12 cuttings in each row.

Harvesting of Roots.

Two rows of plants in each of the 12 plots were dug at the end of 15, 18, 21, 24, 27 and 30 months respectively.

Diagram I.

Arrangement of Plots in Harvesting Experiment with *Derris malaccensis* var. *sarawakensis*.



The same procedure was adopted in each case. The stems of the individual plants were cut down to ground level after which the complete root systems were lifted. These were washed with water to remove adhering soil and the roots separated from the stems. The latter were discarded.

The roots corresponding to each two rows of plants were bulked, cut into short lengths of about 3 inches and dried in the sun to constant weight. Before weighing, any pieces of root having a diameter greater than $\frac{1}{2}$ inch were removed, the final weights being those of the air-dry marketable roots from each two rows of plants.

Yield of Root.

Table I gives the figures for yields of root at different ages.

Table I

Weights of Air-Dry Marketable Roots from two Rows of Plants of *Derris malaccensis* var. *sarawakensis* at Serdang.

Serial No. of Batch	Age of Plants.					
	15 months	18 months	21 months	24 months	27 months	30 months
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1 ...	2.34	1.68	3.31	2.93	1.84	2.14
2 ...	2.22	1.66	2.44	2.73	2.04	0.92
3 ...	2.50	2.68	4.91	4.24	4.25	3.79
4 ...	4.14	4.65	4.49	4.59	4.51	5.41
5 ...	2.28	1.64	2.39	3.07	4.49	2.75
6 ...	2.79	2.19	2.71	1.73	1.62	1.03
7 ...	2.20	2.53	2.90	3.77	3.08	2.34
8 ...	3.05	2.28	2.72	3.69	4.00	4.96
9 ...	1.48	1.90	2.45	4.29	3.15	2.61
10 ...	2.87	2.20	2.10	2.71	2.04	1.38
11 ...	2.45	2.60	2.24	1.82	1.77	1.30
12 ...	1.75	2.11	2.77	2.70	3.70	4.79
Maximum	4.14	4.65	4.91	4.59	4.51	5.41
Minimum	1.48	1.64	2.10	1.73	1.62	0.92
Average	2.51	2.34	2.95	3.19	3.04	2.79

Although the experiment was not planned originally according to the principles of field experimentation, it was thought that a statistical examination of the results might be of interest. Table II gives the analysis of variance of the data of the yields of root from Table I.

Table II

Analysis of Variance of Yields of Root of *Derris malaccensis* var. *sarawakensis* at Serdang.

	Degrees of Freedom	Sum of Squares	Mean Square	Standard Deviation	$\frac{1}{2}\log_e$ (Mean Square)	Z	Z at 5 per cent. point
Between age classes ...	5	6.312	1.262		0.116	0.068	0.425
Within age classes ...	66	72.668	1.101	lbs. 1.05	0.048		
Total ...	71	78.980					

The figures in the above tables indicate a low yield of root, which does not vary significantly over the period covered by the experiment. As will be seen from Table II, the calculated value of z is considerably smaller than that given in Fisher's Table of z for the 5 per cent. point.(3)

The minimum significant difference between any two age means can be calculated as 0.89 lbs., that is the t test shows no significance between any two class means.

Analysis of Roots.

A sample of roots for analysis was drawn on each occasion by the usual method of quartering.

Apart from a few samples, in which rotenone was determined specially and to which reference will be made later, the determination of the toxic content was restricted to the estimation of ether extract, the figures for which are shown in Table III. Table IV gives the analysis of variance of the data of the figures for ether extract from Table III.

The figures in Table IV show that the calculated value of z is greater than both of those taken from Fisher's Tables of z for the 5 and 1 per cent. points respectively.

The z test is therefore significant, indicating that the decrease in percentage of ether extract in the root can be attributed to the increase in age of the plants.

The minimum significant difference between any two age means can be calculated as 2.38 per cent.

The figures in Table III show a steady decline from 15 months onwards. A study of these figures and of the calculated minimum significant difference shows that, taking the figure for 15 months as a basis, the decrease in ether extract becomes significant only when the plants are 24 months old.

Table III

Ether Extract of Marketable Roots from two Rows of Plants of *Derris malaccensis* var. *sarawakensis* at Serdang.

(Moisture-free basis)

Serial No. of Batch.	Age of Plants.					
	15 months	18 months	21 months	24 months	27 months	30 months
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
1 ...	18.67	20.97	18.12	18.18	20.97	16.07
2 ...	24.77	23.19	23.72	16.82	20.82	22.22
3 ...	27.65	26.56	22.99	23.75	20.38	21.53
4 ...	24.88	29.72	23.83	23.32	22.68	22.25
5 ...	28.01	26.05	22.43	22.26	21.41	20.02
6 ...	23.40	23.49	25.88	26.22	23.57	19.79
7 ...	28.00	23.92	24.58	20.95	23.41	16.16
8 ...	24.78	20.06	24.14	24.05	21.30	17.45
9 ...	29.05	23.30	18.27	21.72	21.87	18.06
10 ...	21.76	24.80	21.44	20.60	20.49	20.85
11 ...	23.00	19.26	17.72	16.19	20.00	21.49
12 ...	25.40	19.54	18.40	20.87	14.26	21.58
Maximum	29.05	29.72	25.88	26.22	23.57	22.25
Minimum	18.67	19.26	17.72	16.19	14.26	16.07
Average	24.95	23.41	21.79	21.24	20.93	19.79

Table IV

Analysis of Variance of Ether Extract of Root of *Derris malaccensis* var. *sarawakensis* at Serdang.

	Degrees of Freedom	Sum of Squares	Mean Square	Standard Deviation	$\frac{1}{2}\log_e$ (Mean Square)	Z	Z at 5 per cent. point	Z at 1 per cent. point
Between age classes	5	208.829	41.766		1.866	0.833	0.425	0.602
Within age classes	66	521.306	7.899	per cent. 2.81	1.033			
Total ...	71	730.135						

As mentioned previously, the rotenone content of a few samples was determined for the purpose of obtaining a further indication of the proportion which this constituent bears to the total ether extract for roots of this species of Derris. The results are given in Table V.

Table V

Rotenone Content and Proportion of Rotenone to Ether Extract for Roots of *Derris malaccensis* var. *sarawakensis* at Serdang.

Age of Plants	Serial No. of Batch	Rotenone	Ether Extract	Proportion of Rotenone to Ether Extract
months		per cent.	per cent.	per cent.
27 ...	1	4.22	20.97	20.1
do. ...	5	4.15	20.02	20.7
do. ...	9	4.31	18.06	23.9
30 ...	2	4.39	22.22	19.8
do. ...	6	3.74	19.79	18.9
do. ...	10	4.07	20.85	19.5
			Average	20.5

Discussion.

The figures indicate a low yield of root for this species of Derris, which does not vary significantly over the period covered by the experiment.

Taking an average figure of 2.80 lbs. of air-dry marketable root per two rows of plants the calculated yield amounts to about 570 lbs. per acre. This is approximately half the normal yield usually reckoned when Derris is planted as a sole crop (4).

It is considered that this low yield of root can be attributed largely to the heavy nature of the soil. A heavy soil would appear to be definitely unsuitable for Derris mainly on account of difficulty of root penetration. Further, the difficulty and expense of harvesting root in such soils must not be overlooked.

Although the figures for ether extract do not confirm the observations made as a result of the original small-scale experiment carried out with this species of Derris in respect of a gradual increase in toxic content up to 23 months, both experiments indicate a decrease in ether extract after this age.

The relatively early optimum development of toxic content in the root shown in the present experiment is of considerable interest and further experiments with this species are in progress to confirm the present finding.

An early optimum development of toxic content in the root is of considerable practical importance, especially if further experiments reveal no significant increase in yield of root as the plants increase with age. It will enable better use to be made of the land and of the labour on the estate. Thus in the present experiment as far as yield of root is concerned the land may be said to have been occupied uselessly for 15 months—the whole period of the experiment. Further, from the point of view of return of toxic content per acre (product of yield of root and ether extract) the figures show that the root could have been harvested at any time from 15 to 24 months, after which the decrease in ether extract becomes significant, with a consequent reduction in the amount of toxic content per acre.

The results of the rotenone determinations show that the proportion of rotenone to ether extract is about 20 per cent. This is about 5 per cent. higher than that usually found for this species of Derris. Further determinations of the proportion are being made.

References.

1. Variations in the Amount of Ether Extract of Tuba Root (*Derris malaccensis,* Prain). C. D. V. Georgi, *Malayan Agricultural Journal,* Vol. XVII, No. 10, October 1929, p. 361.
2. Preliminary Selection Experiments with Derris. C. D. V. Georgi, J. Lambourne and Gunn Lay Teik. *Malayan Agricultural Journal,* Vol. XXIV, No. 8, August 1936, p. 374.
3. Statistical Methods for Research Workers. R. A. Fisher.
4. Derris Cultivation in Malaya. J. N. Milsum and C. D. V. Georgi. *Malayan Agricultural Journal,* Vol XXV, No. 6, June 1937, p. 239.

Received for publication 5th March, 1939.

COVER CROPS.*

There are a number of cover plants employed to protect the soil and reduce weeding costs on land planted with permanent crops. The list of species cultivated is a large one, but the following selection has so far proved the most useful for general purposes. With the exception of *Mikania scandens*, which belongs to the Natural Order Compositae, all plants described are leguminous.

Calopogonium mucunoides.

A vigorous climbing or creeping herb with trifoliate leaves forming a dense mat of foliage, 1 to 2 feet high. The flowers are produced in short racemes, small, pale blue in colour. The flattened seeds are brown, and number about 34,000 per lb.

This cover will thrive on a wide range of soils, but is of the greatest value on new clearings, where it will cover the land in four months from sowing. When the shade of the permanent crop becomes dense, the growth of the cover weakens and in time dies down. Calopogonium has proved a valuable cover plant in young rubber and oil palm clearings, either sown as a sole cover crop or as a mixture with Centrosema or Pueraria. The advantages of sowing a mixture are seen when the permanent crop matures, as Centrosema is more hardy than Calopogonium, and gradually replaces the latter, while Pueraria will continue to thrive under shade. Although Calopogonium is liable to die down early, natural regeneration occurs under suitable conditions.

Centrosema pubescens.

A twining herb with trifoliate leaves, forming a loose mat of foliage about 18 inches deep on open land. It climbs any support with which it comes in contact. Flowers pale mauve with purple lines in the centre; three to five produced on a raceme. The seeds are flattened, brownish-green with dark green markings. The number of seeds per lb. is about 16,000.

Centrosema makes rather slow growth in the early stages, but when properly established forms an excellent cover. If the soil is sufficiently fertile, or where the permanent crop is manured, this cover plant will remain effective for many years and continue to thrive under shade. Care is necessary to prevent it from climbing young trees or retarding the growth of the permanent crop by excessive vegetation immediately below the trees or palms. For new clearings or replanting of rubber and oil palm areas it may be grown in combination with Pueraria, and a seed mixture consisting of 5 lbs. Centrosema and 2 lbs. Pueraria per acre has been found most suitable for this purpose.

Dolichos Hosei. Sarawak Bean.

A low, creeping, perennial herb of rather weak growth. Leaves trifoliate and slightly hairy. Several small yellow flowers are produced on a short raceme. The seed is brown in colour, blotched with chocolate markings. About 18,000 seeds weigh 1 lb.

* Copies of the following article, published as a second and revised edition of Agricultural Leaflet No. 6, may be obtained free from the Department of Agriculture, S.S. & F.M.S.. They are not available for distribution outside Malaya.

The Sarawak bean thrives on a loose porous soil and is of particular value on the lighter types of alluvial coastal clay. It is most difficult to establish on undulating land that has suffered from soil erosion. Further, it is a shallow-rooting, moisture-loving plant, and will thrive under dense shade. It has a particular liking for wood-ashes, and on new clearings with abundant residues from burnt-off jungle, or where wood-ashes are applied to the land, vigorous growth is made. Owing to its prostrate habit, little or no trouble is experienced in preventing it from encroaching upon any permanent form of cultivation. It is an excellent cover crop in the fruit orchard or on flat nursery land.

Indigofera endecaphylla.

A low, creeping herb with dark green pinnate leaves and small purplish-pink flowers. The seeds are minute, light brown in colour and number about 220,000 per lb.

This cover plant thrives on land which has not suffered from erosion and it requires a moist rooting surface. It thrives from sea-level up to considerable elevations and is a suitable cover crop under tea. The plants send out trailers, which produce numerous adventitious roots, thus forming a dense low mat over the land. Indigofera is stated to develop a strong tap-root which assists materially in opening up the soil.

Mikania scandens.

A twining indigenous herb belonging to the Natural Order Compositae. Leaves opposite, 2 inches long. Flowers whitish, small and inconspicuous; produced in heads 2 inches wide. The seeds are so small and light that it is impracticable to collect them. The plant when once established spreads with extraordinary rapidity and owing to its twining habit all weed growth is completely checked.

Mikania will grow successfully on almost all types of soil but has been observed to make the most luxuriant growth on heavy alluvial coastal clays. Under such conditions it will cover open land with a dense mat within one month of planting the cuttings, hence it is called the "mile a minute" plant. Although non-leguminous, a dense mat of decaying organic matter is formed on the land. With present knowledge it is not possible to compare its value with the better known leguminous plants, but owing to its rank vigorous growth it appears to have a depressing effect on the development of young rubber and coconuts, particularly if the cover is not kept well away from the base of the trees.

Pueraria phaseoloides.

A strong twining herb, often attaining a considerable size in the wild state in Malaya. Leaves large, trifoliate, hairy. Flowers in racemes in scattered pairs, mauve in colour. Seeds small, dark brown. The number of seeds per lb. is about 37,000.

This cover plant thrives on the heavier types of soils and has proved successful on the alluvial clays of the coast. When once established, a dense thick cover, several feet high, is formed. The plant will continue to thrive under shade, but growth is less robust. It is a rather shy flowerer, consequently seeds are difficult to collect in quantity. Fortunately, Pueraria may be readily propagated from cuttings, which are lifted with numerous adventitious roots.

Owing to its hard coat Pueraria seed absorbs water irregularly and in consequence germination is spread over a long period. In order to obtain more rapid germination the seed may be soaked in water for three days and at intervals of 24 hours all swollen seed should be removed and sown immediately. A 1/9th inch mesh sieve is suitable for separating the swollen seeds. Alternatively, the difficulty may be overcome by rubbing the dry seed between two sheets of wire mosquito netting or abrading the seed coats in a mortar by mixing it with sand and stirring vigorously. As stated previously, this cover crop is often grown as a mixture with Centrosema on both new clearings and replantings.

Propagation.

The several methods of propagating the cover crops described are detailed below in tabular form. Cuttings may be used when seed is expensive or difficult to obtain.

In planting cover crops, whether from seed or cuttings, advantage should be taken of rainy weather and the land be as clean of weeds as possible. Before planting, the rows are lightly forked or cultivated. In the case of small seeds, an admixture of sand facilitates distribution. Seeds that have a hard seed coat or have been stored for some time will germinate more readily if soaked for a period of 24 hours in water raised to a temperature of 110°F. Seeds so treated should not be allowed to dry before sowing. On soils where erosion has already taken place, the addition of either basic slag or rock phosphate mixed with the seed in the proportion of about 10 lbs. of fertilizer to 1 lb. of seed and the mixture sown forthwith assists in establishing the cover plants.

Upkeep.

The main operations in establishing cover crops are systematic weeding between planting and maturity, and removal by hand of all noxious grasses and other growths that may appear through the cover crops. Further, in order to prevent competition for plant nutrients, it is important that a fair-sized circle round the main crop should be kept free from the cover plant.

Digging in the cover plant at intervals of one or two years may be adopted with beneficial results, but when funds are not available for this operation, slashing down the surface growth is recommended to allow of better aeration of the soil.

Covers Under Shade.

According to the Rubber Research Institute it cannot yet be claimed that a satisfactory technique for the establishment and maintenance of a good leguminous cover on mature rubber areas has yet been obtained. There are a few outstanding

Cover Crop.	Method of Propagation.	Rate per acre.	Remarks.
Calopogonium mucunoides	Seed	3-4 lbs.	Rows 3-5 feet apart.
Centrosema pubescens	Seed	5 lbs.	Rows 3 feet apart.
Dolichos Hosei	Seed	5 lbs.	Rows 3 feet apart.
	Cuttings	8 sacks	Rows 3 feet apart.
Indigofera endecaphylla	Cuttings (9 ins. long)	4 sacks	2 ft. x 2 ft. Seed may be used to provide nurseries for cuttings
Mikania scandens	Cuttings (12 ins. long)	2 sacks	5 feet apart.
Pueraria phaseoloides	Seed	3-4 lbs.	Rows 3-5 feet apart.
	Cuttings (2 ft. long)	10 sacks	3 ft. x 3 ft. Seed may be used to provide nurseries for cuttings

successes, but these have been generally accounted for by especially favourable conditions. Experience so far has shown that the important conditions for success appear to be the elimination of root competition, at least in the early stages of establishment, and the use of phosphatic fertilizers; on sandy soils in particular, extra potash may also be required.

Investigations have been carried out by the Institute in the inoculation of seed with the appropriate symbiotic organism; in nearly all cases inoculation has been found to stimulate the rate of establishment of leguminous covers.

References.

Articles on cover crops are obtainable from the Agricultural Economist, Department of Agriculture, S.S. and F.M.S., Kuala Lumpur.

Cover Crops and Green Manures, *Malayan Agricultural Journal*, Vol. XVI, No. 7, price 50 cents.

The Effect of Cover Crops on Soil Moisture, *Malayan Agricultural Journal*, Vol. XVIII, No. 10, price 50 cents.

QUARTERLY REPORT ON THE MALAYAN PINEAPPLE CANNING INDUSTRY,

December 1938 to February 1939.

Prepared by the Economics Branch of the Department of Agriculture, S.S. & F.M.S., from Reports of Field Officers.

Factories.

The total number of registered factories is sixteen, of which only seven operated throughout the short season. Two old factories in Johore were re-conditioned and registered, making a total of eight registered factories in that State. Of the other factories two are in Selangor and six in Singapore. One Selangor factory worked at full capacity during December, but in February supplies of fruit were so short that it worked for only 3 days in that month. The fruit season in Johore ended early in January and most factories ceased work.

Production and Sales.

The production quota fixed by the Central Board for the short season October 15th, 1938 to March 31st, 1939, was 850,000 cases. By the end of February approximately 708,000 cases had been packed.

Singapore reports state that all the fruit packed during the season was sold at prices fixed by the Central Board.

The total exports of pineapples in 1938 amounted to 73,169 tons (or 2,351,006 cases), valued at $7,262,851 (£854,453). The exports during the last months of 1938 and first two months of 1939 were as follows (in tons):—1938, October 4,622; November 4,060; December 4,500; 1939, January 4,487, February 6,884.

The Central Board of Pineapple Packers, Malaya.

Following a long period of uneconomic prices for canned pineapples during 1937 and 1938, the pineapple packers of Malaya formed an Association, during the latter half of 1938, for the purpose of controlling the output of all factories, and fixing the price of canned pineapples at a profitable level. As this Association—the Central Board of Pineapple Packers, Malaya,—would have had little hope of continued existence without legislative backing, they applied to Government for support. The Pineapple Industry Ordinance and Enactments of the Straits Settlements, Johore and Selangor, have been amended to enable the Registrar to refuse to register a pineapple factory the owner of which does not belong to an association representing the pineapple packers of Malaya. The Registrar may also refuse to register a factory provided he is satisfied that there are already sufficient factories to deal with the produce from existing areas under pineapples.

Two important points included in the rules of the Association are:—

1. Growers of pineapples are paid a fixed price for their fruit which is regulated in direct ratio to the price of the canned product.

2. The Malayan Mark Scheme for pineapples (Malayan Mark Pineapple (Grading & Marketing) Regulations, 1938) will be adopted by all packers and will be compulsory after the lapse of two years.

The participating Governments are represented on the Central Board and according to the Rules these representatives have overriding powers, especially in matters affecting the interests of growers and exporters, who are themselves entitled to attend general meetings and to express their views.

The Central Board has continued to function satisfactorily and its rules and by-laws have been accepted by the three Governments concerned (Straits Settlements, Selangor and Johore) after certain amendments had been agreed upon and accepted by the Association.

Although the Association has not yet been legally nominated by these Governments as representing the pineapple industry of Malaya, the Pineapple Industry Ordinance and Enactments have been amended to enable the Governments concerned to do this as soon as formalities regarding the registration of the Association are completed.

Prices.

The formation of the Central Board and its satisfactory operation during the past few months have changed the whole outlook of the pineapple industry from one of deep depression to considerable optimism.

A committee is in process of formation, consisting mainly of officers of the Department of Agriculture, to investigate and devise means to ensure that the grower gets full benefit from the higher prices fixed by the Board, as much of the fruit passes through the hands of dealers before reaching the factories.

The price of fresh fruit bought in the field has varied according to distance from factory and the amount and quality of available fruit. With shortage of supplies prices tended to rise. Singapore prices of fresh fruit, per 100, were from $1.80 to $1, while South Johore prices varied from $1.60 to $1.20 for first quality, $1.20 to 60 cents for second quality, and 90 to 60 cents for third quality. In Selangor, the price was between 80 and 50 cents per 100. In this State arrangements were made whereby information regarding changes in price of fresh fruit will be conveyed to growers.

Quotations in Singapore in dollars per case of 48 cans of 1½ lbs. each, during the three months under review, were as follows:—

Month	General Average Quality. (G.A.Q.)			Golden		
	Spiral	Round	Cube	Spiral	Round	Cube
December 1938 ...	2.90	3.80	3.00	3.20	4.00	3.25
January 1939 ...	2.95	3.80	3.00	3.20	4.00	3.25
February 1939 ...	3.00	4.00	3.00	3.40	4.30	3.45

ANNUAL PRIZE DISTRIBUTION, SCHOOL OF AGRICULTURE, MALAYA.

The annual prize distribution at the School of Agriculture, Malaya, was held at the School on 6th April, 1939. Amongst those present in addition to the staff and students were the Hon'ble the Acting Adviser on Agriculture, and the majority of the members of the School Advisory Committee.

The Principal of the School (Mr. G. E. Mann, M.C.) opened the proceedings by regretting that the Hon'ble the Federal Secretary, Mr. C. D. Ahearne, who was originally invited to present the awards, was prevented by other engagements from doing so. He welcomed the visitors and stated that the Hon'ble Mr. W. N. C. Belgrave, Acting Adviser on Agriculture, had kindly consented to distribute the prizes.

Progress of the School.

Mr. Mann then outlined the activities and progress of the School during the past year. He reminded his listeners that the School had now completed its eighth academic year which began in May 1938 with 62 students and pupils in residence, which was 18 short of capacity. During the year 2 students and 2 pupils were withdrawn, leaving 58; of these, 18 students and 15 pupils were leaving that day on the conclusion of their respective courses of training. Present indications were that some 25 students and 20 pupils would be admitted next month and that the Two Years Course would be full. A small waiting list had had to be opened as the number of applications for admission to the Major Course as private students had exceeded the number of vacancies. It was clear that the Two Year Course continues to be attractive and that the position as regards private students remains satisfactory.

Scholarships.

The Principal announced that the F.M.S. Government had increased its number of Major Scholarships from 6 to 8, of which 4 had been opened to non-Malays. The provision for other Government Scholarships remained unchanged, namely 6 Minor Scholarships for the Federated Malay States and 3 Major and 3 Minor Scholarships for the Straits Settlements. In addition, there was the Edwin Philips Scholarship and, as new ventures, it was expected that next term 2 Malays and 1 Indian would probably be awarded Scholarships by the Captain Kling Mosque Endowment Fund of Penang on the one hand and by an estate in Negri Sembilan on the other hand.

Prospects of Employment.

The speaker reminded his audience that this is primarily a vocational school, at any rate as far as the Two Years Course is concerned, and that public interest centres very largely on the record and prospects of employment. Of the 223

students and pupils who had completed their training by the end of last year, 176 were known to have found salaried posts. The actual figure was probably higher as some old boys had not kept in touch with the School. The large majority of these 176 had been absorbed into Government service and the Rubber Research Institute of Malaya, but some 17 old boys had found their way into commercial enterprises as employees on estates or in firms.

Of the 33 boys now leaving, Mr. Mann expected that 4 would enter the Department of Agriculture and 5 the Rubber Research Institute, while one would resume duty as an Assistant Penghulu. He was confident that, as in the past, the majority of second year students would find employment in one capacity or another.

Continuation Scholarships and Paid Apprenticeships were now offered by the F.M.S. Government to selected Malays who had obtained the School Diploma and wished to receive a more intensive training as conductors on estates. Two such scholarships were awarded last July. One of the holders failed to make satisfactory progress and his scholarship was therefore terminated; the other was getting on well and it was understood that he stands a very good chance of finding a salaried post if he wants to when his apprenticeship ends.

School Activities.

The Principal stated that the curriculum had had time to settle down into smooth working order. On the practical side, the value of the weekly field day at the Central Experiment Station and of special courses on subjects such as bud-grafting of rubber and the kiln-drying of copra had continued to be emphasized.

He regretted that there had been some falling off of enthusiasm over organized games and reminded those of his audience who would be second-year students very soon that he looked to them to restore that keenness on games which was formerly so noticeable and gratifying.

The Old Boys Society, inaugurated two years ago, had continued its unostentatious existence. Its members were comparatively few and scattered so that the principal activity of the Society at present lay in assistance to the School Magazine, the third number of which was published last October.

Poultry.

The speaker continued:—"Our poultry section continues to attract considerable attention as is evidenced by the fact that revenue from this source last year was $1,400. Comparative observations on the growth-rate and productivity of Rhode Islands, native and upgraded birds have been continued and sufficient information has now been acquired to enable me, in collaboration with various field officers, to design field experiments which aim at testing the practical value of cheap supplementary rations under average kampong conditions. The health of our flocks has remained good on the whole, there being no outbreak of any of the epidemic diseases which periodically cause such heavy losses in the villages."

In conclusion Mr. Mann recorded the great interest which the McLean Commission on Higher Education took in the School when they visited it in November last. He also paid a tribute to his staff and to other officers of the Department of Agriculture and the Rubber Research Institute for help and advice willingly given during the year.

Mr. Mann then called upon Mr. Belgrave to distribute the prizes, diplomas and certificates which had geen gained by students and pupils leaving the School that day.

Speech by the Acting Adviser on Agriculture.

In the course of his remarks to students and pupils now leaving the School, Mr. Belgrave emphasized that the extent to which their present training would be justified and repaid depended on the way in which they applied the knowledge and experience gained to the problems confronting them.

The deeper they studied the subject the more they would realize that we knew very little about the natural laws governing agriculture, because the visible result—the growth of the plant—was only the end of a complicated and invisible network of a great number of forces, which might be acting in different directions. He suggested, however, that when in after life they met with results which appeared to conflict with accepted teachings they should not be discouraged, but should study the subject further, and should not hesitate to seek to take advantage of the advice and help of those more experienced.

Mr. Cheeseman, Chief Inspector of English Schools, in a happy speech delivered in the Malay language, urged that the knowledge and experience they gained in their studies should in after life be translated into action. The most impressive advice, he said, was not the spoken word but the speaking action, the living example. The practical success of their diligence, energy and attention to hygiene, and above all, the successful application of the methods they had learnt at school, would, by example, bring about a great change in the life in the villages. The Education and Agricultural Departments, he concluded, were working together for the Malays of this country with but one end in view—the happiness and prosperity of the race. He hoped that the Malay students from this school would do their utmost to further this prosperity.

MEETING OF THE AGRICULTURAL ADVISORY COMMITTEE, 22nd March, 1939.

A meeting of the Agricultural Advisory Committee was held at the Department of Agriculture, Kuala Lumpur, on 22nd March 1939, under the chairmanship of the Hon'ble the Acting Adviser on Agriculture, Malay States. There was a full attendance of members of the Committee.

The following abstracts from the minutes of the meeting deal with discussions on various crops.

The Pineapple Industry.

The research factory at Johore Bahru has not yet started operation. The installation is complete with the exception of one machine.

No factory is yet employing the Malayan Mark, but it is hoped that it may be possible to do so by about the end of this year or early in 1940.

Tea.

Experiments at the Central Experiment Station, Serdang, on Chinese tea manufacture have not been as successful as was anticipated. Dealers had criticised the steamed taste of the tea and had indicated that they require a dry heat method of preparation. Work on this line has been undertaken but the cost of manufacture has been high, the estimated factory cost being about 8 cents per kati.

It is considered unlikely that it will be possible to reduce the all-in cost of China tea below 20 cents per lb. *i.e.* about 2 cents per lb. less than the cost of Indian tea at the Central Experiment Station. The intention of the experiments was to find an outlet for local estate teas on the cheaper Malayan market.

It was agreed that there is at present no point in proceeding further with these experiments at the Central Experiment Station in view of the fact that the vast majority of China tea consumed in Malaya is taken by the labouring classes, who can afford only the very cheapest article.

Compost.

An article on composting has appeared in the *Malayan Agricultural Journal* and a leaflet on the subject has been published by the Department. Good results have been obtained with compost for vegetable growing at Cameron Highlands and an experimental programme is now being considered. A member suggested that it is desirable that a further article on this subject be published in the *Malayan Agricultural Journal* in which the cost of production of compost might be indicated. The Chairman agreed to consider this suggestion and, if possible, to show the expenditure of labour in its preparation at Serdang, also to include in the article comments from other sources on the subject.

Supply of Rubber Budwood to Small-Holders.

The Chairman reported that satisfactory progress had been made in regard to budwood nurseries at various Agricultural Stations, and that a total area of about 25 acres had been established. Growth is generally satisfactory.

Manila Hemp.

Reports from two dealers in London on samples of Manila hemp prepared at the Central Experiment Station, Serdang, have been received. A machine from British North Borneo has been installed at the Central Experiment Station. The results, however, have been unsatisfactory as labour costs are too high. Endeavours are now being made to obtain a Dyak expert from British North Borneo to demonstrate the proper working of the machine.

Papain.

In March, 1938, a letter was received from a Canadian firm regarding their interest in procuring papain and asking to be put into touch with producers. A notice to this effect was inserted in the *Malayan Agricultural Journal* for March, 1938, and as a result about fourteen letters were received from persons interested in the matter. The addresses of these were sent to the Canadian firm and the latter has communicated direct with some of them. The Department has distributed notes on the cultivation of papaya and production of papain to all enquirers.

EMPLOYMENT FOR EX-STUDENTS OF THE SCHOOL OF AGRICULTURE.

A few students (mainly Chinese) who recently left the School of Agriculture on completion of their Two Years Course of training are desirous of finding employment. Enquiries from managers of estates or other employers would be welcomed and should be addressed to the Principal.

Departmental.

FROM THE DISTRICTS.

Compiled by the Chief Field Officer from Monthly Reports of Agricultural Officers.

March, 1939.

The Weather.

The weather has been dry in most localities. Showers and storms have occurred and the total precipitation approximated to normal. Showers became more frequent during the last part of the month.

In North Perak some exceptionally heavy storms occurred. The rain gauges at Taiping and Maxwell's Hill recorded 23.13 and 18.80 inches respectively, which is considerably in excess of the average for March.

In Selangor coastal areas rainfall was low.

Crop Reports.

Rubber.—Trees have been wintering. Owing to the resultant lower yields and also owing to the fact that most small-holders had used up their allowance of coupons, very little tapping has been done. Prices remained at about the same level as in February, ranging between $32 and $36.20 a picul for smoked sheet according to locality.

The usual seasonal occurrence of mild attacks of *Oidium Heveae* has been reported from many districts.

It is mentioned in the Perak report that in Parit District alone 2,500 acres of jungle land have been taken up by Malays for rubber planting.

Padi.—The harvest is still proceeding in Krian. Yields are said to be slightly higher than last year, but quality is reported to be rather poor. As planting was not carried out simultaneously, harvesting will continue over a long period. There will, therefore, be no shortage of labour. Rates for harvesting have now dropped to 15 gantangs for each 100 reaped plus food and 50 cents in cash per relong (0.71 acre).

The sealing of bags of Seraup 48, passed by Departmental officers as being sufficiently pure to warrant the payment of the premium, commenced in the fields on February 19th. It was later decided to examine and seal this padi at the mills as well as in the field and sealing commenced at Parit Buntar Mill on March 5th and at Bagan Serai on the 14th. At the present time 90 per cent. of the sealed padi taken by the Parit Buntar Mill is sealed at the mill and not in the field, whilst the corresponding figure for Bagan Serai Mill is 50 per cent.

In Malacca yields are generally rather lower than last season but a fairly good crop has been reaped in inland areas near Alor Gajah.

The harvest in Kelantan is nearing completion. The dry-land padi crop has been patchy, but in most localities yields have been better than last year. Late planted areas are yielding poorly.

All the small rice mills recently erected in Kedah, Province Wellesley and Perak are working at full capacity. Some of the owners have taken advantage of a brisk

demand for milling to increase their charges from $\frac{1}{2}$ to $\frac{3}{4}$ gantang for each 10 gantangs of padi milled. Two new mills have been erected in Kedah.

At the Temerloh Mill padi is being bought at the rate of about 73 piculs per day which is unusually brisk buying for this mill. During the period 29th January to 24th March a total of 3,858 piculs has been purchased, which slightly exceeds the total amount bought during the year 1938. There still remains a large quantity of padi to be bought, and it is estimated that at least a further 2,000 piculs will be forthcoming in the Temerloh District.

Agricultural Instruction.

The Farm School at Ayer Itam, Penang, opened on March 1st. There are now 12 pupils, which is as many as the instructor can satisfactorily teach. Vegetable plots have been planted by each boy, and expeditions are being arranged for every Saturday. Arrangements are being made to hold a carpentry class once a week. Ex-farm school students have found that they have needed to build themselves poultry houses and pig sties, and a knowledge of carpentry would have stood them in good stead.

The following is a quotation from the Kedah monthly report:—

> " Fourteen schoolboys of Standard VII attended a two weeks' course on the Gajah Mati Agricultural Station from 23.1.58 to 8.2.58 (15th March —30th March, 1939). Field work covered poultry management (hens and ducks); budding and marcotting, preparation of fungicides and insecticides, composting and vegetable cultivation. Lectures were given by the Assistant Agricultural Officer in charge (after these had been examined and approved in draft). This instruction at the Agricultural Station forms part of the year's course for Standard VII and VIII boys which is now being brought into being. Some subjects are more easily treated at the Agricultural Station than at the Sungai Korok School (where the greater part of the instruction is to be given). A second 2 weeks' course at Gajah Mati is contemplated later during the year. Boys were accommodated on the Station and did all their own cooking, etc."

Other Matters of Interest.

The Agricultural Officer, Brunei, recently visited Jesselton and Kota Belud Districts of British North Borneo to make preliminary arrangements for the shipment of buffaloes to Brunei for sale to padi cultivators. Twenty-nine animals have already been purchased and shipped, and arrangements were made for shipping a further 200. The export of buffaloes from certain districts in British North Borneo has been banned for several months owing to an outbreak of "surra" disease among ponies.

The fact that a well-managed orchard can be very profitable was mentioned in the January number. A further instance is that at Sungei Choh in Selangor where the harvesting of a duku orchard has recently been completed. From an area of $6\frac{1}{2}$ acres 800 boxes of fruit were harvested which were sold at $2.70 per box, representing a gross return of $2,160.

DEPARTMENTAL NOTES.

Visitors.

H. S. H. Prince Lakshanakara Kashemsant of the Ministry of Agriculture, Siam, and Luang Vichien Dhatukar of the Ministry of Economic Affairs, Siam, recently visited the headquarters of the Department of Agriculture, S.S. and F.M.S., at Kuala Lumpur, the Central Experiment Station, Serdang, and the Agricultural Station, Cameron Highlands.

Translation of a Text Book on Rubber.

By arrangement with the Rubber Research Institute, the Department of Agriculture, S.S. and F.M.S., has now completed and distributed Malay and Chinese editions of a book on Rubber-Growing: Elementary Principles and Practice, which was published in English in 1938 by the Rubber Research Institute of Malaya. These editions in the vernacular languages have proved so popular and have been of such assistance to the Asiatic Rubber Instructors that a version in the Tamil language will be published in the course of a few months' time.

Rice Mills Give Bonus for Selected Padi.

The Government Rice Mills in Krian, Perak, continue to give a bonus of 10 cents per picul for the variety of padi known as Seraup Kechil 48, contained in sacks sealed by officers of the Department of Agriculture. This variety, which was isolated by the Department as a result of many years' work at the Padi Experiment Station at Krian, proves to be particularly acceptable owing to its excellent milling qualities.

The area cultivated with this strain is steadily increasing. From February 19th, when sealing of sacks commenced, until the 28th March, 78,000 sacks of padi received at the Government Mills obtained the bonus, only about 100 sacks being rejected, while of the total amount of padi received at one mill nearly 50 per cent. was sealed padi.

Leave.

Mr. F. Birkinshaw, Chief Field Officer, returned from leave on 23rd February 1939. Mr. A. E. Coleman-Doscas, Acting Chief Field Officer, has returned to his substantive post of State Agricultural Officer, Johore.

Mr. H. T. Pagden, Entomologist, returned from leave on 10th March, 1939.

Mr. H. J. Simpson, Agricultural Officer, returned from leave on 17th March 1939, and assumed duty in the post of Agriculturist with effect from 18th March 1939.

Mr. C. L. Newman, State Agricultural Officer, Selangor, has been granted 243 days leave from 11th March 1939.

Mr. B. A. Lowe, Agricultural Officer, has been granted 240 days leave from 11th March 1939 inclusive.

FERTILIZER PRICES, MARCH, 1939.

The following are the prices at the end of March, 1939, of some of the more important fertilizers.

Product.	Analysis				Price per ton $
	Nitrogen (N)	Phosphoric Acid (P_2O_5)		Potash (K_2O)	
		Soluble	Insoluble		
Sulphate of Ammonia ...	20.6	—	—	—	72.75
Calcium Cyanamide ...	20.6	—	—	—	80.00
Muriate of Potash ...	—	—	—	50	112.00
Sulphate of Potash ...	—	—	—	48	112.00
Superphosphate (concentrated) ...	—	39	—	—	105.00
Superphosphate ...	—		—	—	60.00
Basic Slag ...	—	16	—	—	48.00
Rock Phosphate (Christmas Island) ...	—	11*	38‡	—	33.50
Rock Phosphate (very finely ground Gafsa) ...	—	11*	26 - 28‡	—	40.00
Lime ...	—	—	—	—	20.00

* Citric soluble. ‡ Total.

Quotations are *ex* warehouse, Port Swettenham, Klang, Singapore and Penang, with the exception of muriate of potash which is *ex* warehouse, Port Swettenham, Klang and Singapore.

The above quotations for concentrated superphosphate, superphosphate and Christmas Island phosphate are *ex* warehouse Penang, Port Swettenham and Klang. The Singapore quotations for these three fertilizers are $95, $50 and $31.50 per ton respectively.

Statistical.

MARKET PRICES.

March 1939.

Major Crops.

Rubber.—The political tension in Europe was responsible for a fall in the rubber market in the second half of the month. No 1 X. Rubber Smoked Sheet, loose, opened in Singapore at 28⅝ cents per lb., and improved to 29 cents on the 9th March. There followed a fall to 27⅜ cents on the 18th, and a further sharp fall to 26½ cents on the 20th. The price immediately recovered, however, and the market closed at 27¼ cents.

The average of daily quotations was 28.11 cents per lb., as compared with 27.24 cents in February. The London average quotation per lb. was 8.14 pence and New York 16.21 cents gold, as compared with 7.96 pence and 15.85 cents gold in February.

Prices paid for small-holders' rubber at three centres during the month are given in Table I.

Table I.

Weekly Prices Paid by Local Dealers for Small-Holders' Rubber, March, 1939.

(Dollars per picul of 133 1/3 lbs.)

Grades	Kuala Kangsar, Perak	Kuala Pilah, Negri Sembilan			Batu Pahat, Johore.				
	15	2	9	16	1	8	15	22	29
Smoked Sheet ...	35.00	35.77	36.20	35.50	—	—	—	—	—
Unsmoked Sheet ...	—	34.50	—	35.00	34.50	34.00	33.61	32.60	31.91
Scrap ...	No purchases								

Transport by F.M.S.R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway $10.00 per ton (minimum consignment 5 tons).

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

At Kuala Kangsar the standard deduction for moisture in unsmoked sheet is 10 per cent.

No purchases of rubber at Kuala Kangsar on 1st, 8th, 22nd and 29th, and at Kuala Pilah on the 23rd and 30th March.

Palm Oil.—Prices again improved slightly during March and are given in Table II. The February averages of weekly quotations were:—palm oil £13.3.9, kernels £8.13.2.

Table II.

Prices of Palm Oil and Palm Kernels.

Date 1939.	Palm Oil in Bulk, c.i.f. landed weight Liverpool/ Halifax.	Palm Kernels, c.i.f. landed weight London/ Continent
	per ton	per ton
March 3	£ 13. 10. 0 Liverpool	£ 9. 0. 0 Hamburg
,, 10	13. 15. 0 ,,	9. 1. 3 ,,
,, 17	13. 15. 0 ,,	8. 17. 6 Rotterdam
,, 24	13. 10. 0 ,,	8. 15. 0 ,,
,, 31	13 5. 0 ,,	8. 10. 0 ,,
Average	£ 13. 11. 0	£ 8. 16. 9

Copra.—The improvement noted in this market in February was not maintained in March, and the sun-dried grade fell steadily from an opening price in Singapore of $3.80 per picul to $3.40 on the 30th, but closed on a rising note at $3.45. The average Singapore price for this grade was $3.64 per picul, and for the mixed grade $3.34, as compared with $3.53 and $3.23 in February.

Copra cake continued unchanged at $1.60 per picul.

Rice.—The Singapore average wholesale prices of rice per picul in February were as follows:—Siam No. 2 Ordinary $4.02, Rangoon No. 1 $3.07, Saigon No. 1 $3.27, as compared with $4.22, $2.92 and $3.30 in January and with $4.15, $3.82 and $3.92 in February 1938.

The average retail prices in cents per gantang (gallon) of No. 2 Siam rice were: Singapore 27, Penang 32, Malacca 30, as compared with 27, 32 and 30 in January.

The average declared trade value of imports during February was $3.68 per picul, as compared with $3.78 in January and $3.85 in December and $3.85 in February 1938.

Padi.—In Perak, padi prices per 100 gantangs (gallons) were between $7 and $8, with the exception of Perak South where prices ranged from $6.50 to $13. In Pahang the range was from $8 to $12, Kedah $6.50 to $7.50, Malacca $9 to $10, and Negri Sembilan $7 to $13. In Kelantan and Penang the price was $8.

The Government Rice Mill at Bagan Serai, Perak, increased its price for padi from $2 to $2.10 per picul towards the close of the month, but the other Government Mill at Parit Buntar maintained its price unchanged at $2. The Government Rice Mill, Temerloh, Pahang, paid $2.20 per picul.

Pineapples.—Singapore prices of canned pineapples, per case of 48 cans of 1½ lbs. each, as fixed by the Central Board of Packers were as follows:—G.A.Q. Spiral $3.05, Round (Flat) $3.85, Cube $3.10; Golden $3.45, $4.25 and $3.50 respectively.

Fresh fruit prices in Singapore were $1 to $1.50 per 100, and in Selangor 50 to 80 cents.

Beverages.

Tea.—Two consignments of Malayan highland tea, comprising 132 packages, were sold on the London market during March at 1s.2½d. and 1s.3d. per lb. Six consignments of lowland tea (502 packages) were sold at prices ranging from 10¼d. to 1s.0¼d. per lb., the average price being 11.63d. per lb.

According to the *Tea Market Reports* for March of the Tea Brokers' Association of London, the average London prices per lb. realized for tea from other countries were as follows:—Ceylon 1s.3.95d., Java 1s.1.25d., Indian Northern 1s.0.68d., Indian Southern 1s.2.44d., Sumatra 10.65d.

The latest Colombo average prices available, quoted from *The Ceylon Tea Market Report* of 28th March 1939 of the Colombo Brokers' Association, are as follows, in rupee cents per lb.:—High Grown Teas 85, Medium Grown Teas 73, Low Grown Teas 66.

Coffee.—Liberian coffee was quoted throughout the month at $14.50 per picul. Excelsa opened at $10.25, fell to $10, and recovered to $10.25. Robusta opened at $6.50, fell to $6, and recovered to $6.50.

The average of highest and lowest quotations in Singapore for Palembang coffee was $9.20 to $10.95, and for Sourabaya coffee $11.13 to $12.25, the price within these ranges depending upon quality.

Spices.

Arecanuts.—The averages of the Singapore Chamber of Commerce quotations per picul were:—Best $7.08, Medium $6.49, Mixed $6.01.

The averages of highest and lowest quotations per picul in Singapore were as follows:—Splits $8.25 to $12.20; Red Whole $4.75 to $6.35; Sliced $4.45 to $6.55; as compared with $4.50 to $7.60, $6.20 to $9.37, and $9 to $11.75 respectively in February.

Pepper.—There was almost complete lack of demand during March, and prices fell in the second half of the month. Average Singapore prices per picul were:—Singapore Black $8.37, Singapore White $13.19, Muntok White $13.49, as compared with $8.62, $13.19 and $13.44 in February.

Nutmegs.—The Singapore price for both 110's and 80's fell to $28 per picul, and the month's average was $28.50, as compared with $29.50 in February. Penang dried nutmegs were sold at $19 per picul.

Mace.—Nominal quotations for Siouw in Singapore remained unchanged at $85 per picul. Amboina was quoted throughout the month at $58. The February average prices were $82.50 and $60 respectively. In Penang, locally produced mace, dry, was sold at $75 per picul.

Cloves.—Singapore nominal quotations for both Zanzibar and Amboina continued unchanged at $40 per picul. Penang cloves, dried, sold in Penang at $45 per picul.

Cardamoms.—Green cardamoms were quoted in *The Ceylon Chamber of Commerce Weekly Report* for 27th March 1939 from Rs. 1.12 to Rs. 1.23 per lb.

Miscellaneous.

Derris.—There was no change in the March average prices in Singapore for roots sold on a basis of ether extract which were $8 to $10 per picul. Roots sold on a basis of rotenone content averaged $17.50 to $19.50 per picul, as compared with $18 to $20 in February. Demand slackened somewhat during the month and roots were again more freely available.

Gambier.—Prices continued unchanged in Singapore during March: Cube No 1 $15 per picul, Block $7 (nominal) per picul.

Sago.—Pearl was quoted throughout the month at $3.80 per picul in Singapore as compared with an average price of $3.71 in February. Flour, Sarawak Fair, also improved to average $2.29 per picul, as compared with $2.24 in February.

Tapioca.—Flake Fair was quoted throughout the month in Singapore at $3.85 per picul, as compared with the February average of $3.89. Seed Pearl and Pearl Medium continued unchanged at $3.90 and $4.50 respectively.

Tobacco.—Kelantan prices for prepared tobacco were lower: 1st quality $108, 2nd quality $80, 3rd quality $65 per picul. In Perak the range of the three grades was $22 to $12; $14 to $28; $7 to $22; in Kedah $35 to $45; $25 to $33; $14 to $24; in Pahang $16 to $40; $10 to $26; $5 to $18; in Negri Sembilan $15 to $22; $10 to $14; $8 to $12. In Malacca the 1st quality ranged from $19.50 to $23.

The above prices are based on London and Singapore daily quotations for rubber, on the Singapore daily prices for copra, on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports and certain coffee prices are kindly supplied by Guthrie & Co. Ltd., Kuala Lumpur, the Singapore prices of imported coffee and arecanuts by Lianqui Trading Company of Singapore, and Singapore derris prices by Hooglandt & Co., Singapore.

1 Picul = 133 1/3 lbs. The Dollar is fixed at two shillings and four pence.

Note.— The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Trafalgar Square, London, W.C.2.

GENERAL RICE SUMMARY*

February, 1939.

Malaya.—The February imports of foreign rice were 77,106 tons,† and exports 15,107 tons, net imports being 61,999 tons as compared with 52,402 tons in 1938.¶

Of the February imports 56 per cent. were consigned to Singapore, 13 per cent. to Penang, 6 per cent. to Malacca, 19 per cent. to the Federated Malay States and 6 per cent. to the Unfederated Malay States. The foreign imports by countries of origin were as follows (in tons, percentages in brackets):—Siam 53,803 (69.8), Burma 19,059 (24.7), French Indo-China 3,179 (4.1), other countries 1,065 (1.4).

Of the exports during February 71 per cent. were consigned to the Netherlands Indies and 29 per cent. to other countries. The various kinds of rice exported were as follows (in tons, percentages in brackets):—Siam 9,584 (63.4), Burma 4,419 (29.3), French Indo-China 683 (4.5), parboiled 348 (2.3), Malayan production 73 (0.5).

February net imports, by countries of origin, were (in tons, percentages in brackets):—Siam 44,219 (71.3), Burma 14,640 (23.6), French Indo-China 2,496 (4.0), other countries 644 (1.1).

India.—Foreign exports during January were 18,000 tons, equalling exactly the exports in 1938. Of these exports 44.4 (50.0) per cent. were to Ceylon, 5.6 (5.6) per cent to the Straits Settlements and the Far East and 50.0 (44.4) per cent. to other countries. The figures in brackets are for 1938.

According to the final rice forecast for the season 1938-39 for All-India, the area and yields of rice are estimated at 72,574,000 acres and 23,577,000 tons, showing an increase of 0.03 per cent. in area but a decrease of 11.9 per cent. in yield as compared with the previous season. The condition of the crop appears to be fair on the whole.

Burma.—Foreign exports from the 1st January to the 1st March totalled 684,249 tons, as compared with 556,987 tons in 1938, an increase of 22.8 per cent. Of these exports 61.4 (48.3) per cent. were to India, 6.6 (9.8) per cent. to the United Kingdom, 5.6 (3.5) per cent. to the Continent of Europe, 12.0 (15.2) per cent. to Ceylon, 8.3 (14.6) per cent. to the Straits Settlements and the Far East, and 6.1 (8.6) per cent. to other countries. The 1938 corresponding percentages are given in brackets.

Average February prices in rupees per 100 baskets of 75 lbs. each in Rangoon were:—Big Mills Specials 193, Small Mills Specials 195.

According to the final forecast of the rice crop in Burma for the season 1938-39, the area likely to mature is estimated at 12,529,200 acres, a decrease of 61,900 acres or 0.5 per cent. as compared with the final figures for the previous season.

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* Abridged from the Rice Summary for February 1939 compiled by the Department of Statistics, Straits Settlements and Federated Malay States.

† Ton = long ton (2,240 lbs.).

¶ It is to be understood throughout the summary that all comparisons and percentage increases or decreases are in relation to the corresponding period of 1938.

The district estimates now indicate a total yield of 8,044,000 tons of padi, and an exportable surplus of 4,797,000 tons of padi, the equivalent of 3,550,000 tons of rice and rice products.

Siam.—The 1938 exports of rice and rice products from Bangkok totalled 1,450,897 tons as compared with 943,224 tons in 1937.

Japan.—The total area under rice in Japan for the year 1938 was officially reported as 7,890,774 acres, representing an increase of 0.2 per cent. over 1937.

The final figures for the second Formosan rice crop of 1938 amounted to 691,480 tons. The year 1938 established a new record for each crop singly as well as for the two together, the two crops totalling 1,376,535 tons. The total area for the two crops is the smallest since 1930 when the crop was only 1,033,688 tons.

The 1938 rice crop of Korea amounted to 3,385,536 tons, a decrease of 372,802 tons or 9.9 per cent. as compared with the previous year.

French Indo-China.—Entries of padi into Cholon during January and February totalled 383,232 tons, as against 254,367 tons in 1938, an increase of 50.7 per cent. Exports of rice during the same period were 243,017 tons, a decrease of 0.5 per cent. when compared with 244,175 tons in 1938.

Prices of rice and padi rose during January.

Ceylon.—Imports during January and February were 101,053 tons as compared with 88,249 tons in 1938, an increase of 14.5 per cent. Of these imports 14.0 (13.8) per cent. were from British India, 68.9 (76.1) per cent. from Burma, 1.0 (1.1) per cent. from the Straits Settlements and 16.1 (9.0) per cent from other countries. The 1938 corresponding percentages are in brackets.

Europe and America.—Shipments from the East to Europe from the 1st January to 10th February were 86,368 tons, as compared with 40,298 tons in 1938, an increase of 114.3 per cent. Of these shipments 27.5 (10.9) per cent. were from Burma, 58.3 (74.0) per cent. from Saigon, 14.1 (14.1) per cent. from Siam, and 0.1 (1.0) per cent. from Bengal. The percentages in brackets are for 1938.

Shipments for the Levant from the 1st January to 9th February were 2,231 tons, as compared with 1,040 tons in 1938, an increase of 114.5 per cent. Shipments for Cuba, West Indies and America from 1st to 21st January totalled 8,763 tons, as as compared with 9,532 tons in 1938, a decrease of 8.1 per cent.

MALAYAN AGRICULTURAL EXPORTS, JANUARY, 1939.

PRODUCT.	Net Exports in Tons		
	Year 1938	January 1938	January 1939
Arecanuts ...	33,769	3,084	3,710
Coconuts fresh ...	116,743†	5,043†	7,445†
Coconut oil ...	49,140	3,058	4,848
Copra ...	68,754	5,690	640*
Copra cake ...	1,632	181	67
Gambier, all kinds ...	7,112	653	855
Palm kernels ...	9,359	696	998
Palm oil ...	54,377	4,494	3,326
Pineapples, canned ...	73,168	5,631	4,487
Rubber ...	360,898¶	40,024¶	32,574¶
Sago,—flour ..	4,537	39	1,082
,, —pearl ...	4,203	390	187
,, —raw ...	5,088*	499*	206*
Tapioca,—flake ...	981	101	33
,, —flour ...	3,072*	247*	144*
,, —pearl ...	17,818	1,261	1,092
Tuba root ...	676	25	24

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION OF PALM OIL AND KERNELS

(In long tons, as declared by Estates)

Month 1939	Palm Oil		Palm Kernels	
	F.M.S.	U.M.S.	F.M.S.	U.M.S.
January	2,402.5	2,726.3*	429.7	502.0
February	2,193.4	1,693.3	372.9	282.0
Total ...	4,595.9	4,419.6	802.6	784.0
Total January and February, 1938	4,282.1	2,766.3	754.1	493.0
Total for the year 1938 ...	28,979.0	22,087.7	5,158.9	3,620.0

* Revised figure.

Stocks on estates as at 28th February, 1939, were: palm oil 3,382 tons, palm kernels 691 tons.

MALAYAN RUBBER STATISTICS

Acreages of Tappable Rubber actually Tapped and not Tapped on Estates of 100 Acres and over, for the Month ending 28th February, 1939.

State or Territory	Estimated Acreages of Tappable Rubber (9)+(11)	Acreages of tappable rubber not tapped: On estates which have entirely ceased tapping		On estates which have partly ceased tapping (a)		Area of tappable rubber never been tapped (b)		Total area not tapped (3)+(5) (c)		Total area tapped during the month		Area of tappable rubber rested under rotational systems (c)	
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)	Acreage	Percentage of (9) to (2)	Average	Percentage of (11) to (2)	Acreage	Percentage of (13) to (2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
S. S.—													
Province Wellesley ...	43,245	834	1.9	16,342	37.8	505	1.2	17,176	39.7	26,069	60.3	7,931	18.3
Malacca ...	121,225	5,379	4.4	33,573	27.7	2,179	1.8	38,952	32.1	82,273	67.9	26,031	21.5
Penang ...	2,480	63	2.5	974	39.3	9	0.4	1,037	41.8	1,443	58.2	60	2.4
Singapore ...	32,013	6,986	21.8	10,014	31.3	135	0.4	17,000	53.1	15,013	46.9	3,401	10.6
Total S.S. ...	198,963	13,262	6.7	60,903	30.6	2,828	1.4	74,165	37.3	124,798	62.7	37,423	18.8
F. M. S.—													
Perak ...	286,251	10,113	3.5	78,815	27.6	8,408	2.9	88,928	31.1	197,323	68.9	49,504	17.3
Selangor ...	321,054	7,272	2.3	69,981	21.8	7,339	2.3	77,253	24.1	243,801	75.9	56,292	17.5
Negri Sembilan ...	256,303	18,953	7.4	65,938	25.7	7,925	3.1	84,891	33.1	171,412	66.9	44,720	17.4
Pahang ...	86,902	7,331	8.4	26,199	30.2	6,787	7.8	33,530	38.6	53,372	61.4	10,365	11.9
Total F.M.S. ...	950,510	43,669	4.6	240,933	25.3	30,459	3.2	284,602	29.9	665,908	70.1	160,881	16.9
U. M. S.—													
Johore ...	482,275	22,806	4.7	137,015	28.4	36,611	7.6	159,821	33.1	322,454	66.9	72,533	15.0
Kedah ...	200,888	9,630	4.8	34,476	17.2	6,974	3.5	44,106	22.0	156,782	78.0	44,862	22.3
Kelantan ...	31,322	403	1.3	7,262	23.2	2,483	7.9	7,665	24.5	23,657	75.5	5,442	17.4
Trengganu (d) ...	4,817	nil	nil	49	1.0	nil	nil	49	1.0	4,768	99.0	1,651	34.3
Perlis (e) ...	1,394	323	23.2	311	22.3	98	7.0	634	45.5	760	54.5	164	11.8
Brunei ...	5,745	nil	nil	2,801	48.8	316	5.5	2,801	48.8	2,944	51.2	570	9.9
Total U.M.S. ...	726,441	33,162	4.6	181,914	25.0	46,482	6.4	215,076	29.6	511,365	70.4	125,222	17.2
Total Malaya ...	1,875,914	90,093	4.8	483,750	25.8	79,769	4.3	573,843	30.6	1,302,071	69.4	323,526	17.2

Notes.—(*a*) Area out-of-tapping on estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(*b*) The acreage shown in column (7) is included in columns (3) and (5).

(*c*) Areas of tappable rubber rested under rotational systems are not considered as out-of-tapping and therefore columns (11) and (12) include columns (13) and (14) respectively.

(*d*) Registered companies only.

ACREAGE, STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF FEBRUARY, 1939, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January & Feb. 1939		during the month		January & Feb. 1939						
	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. & Feb. 1939	during the month	Jan. & Feb. 1939	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. & Feb. 1939
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	5,770	26,608	9,421	20,100	2,942	9,281	Nil	Nil	Nil	Nil	10,613	1,229	23,322	4,773	...	5,374	27,512	13	31
Johore ...	...	2,385	9,854	4,214	8,766	2,320	5,895	Nil	35	Nil	68	2,801	3,737	5,855	8,786	...	2,255	10,015	...	...
Kedah ...	...	295	5,820	2,231	4,958	508	1,721	Nil	Nil	Nil	Nil	1,260	1,346	2,539	3,926	...	231	6,017	...	...
Perlis ...	...	17	32	10	22	9	41	Nil	Nil	Nil	Nil	Nil	23	Nil	61	...	9	36	...	...
Kelantan ...	...	443	628	333	567	503	1,063	Nil	Nil	Nil	Nil	166	509	403	1,083	...	593	639	...	...
Trengganu ...	...	40	292	127	210	207	400	Nil	Nil	Nil	Nil	Nil	327	Nil	611	...	26	313	...	...
Brunei ...	...	14	100	37	80	50	131	...	...	...	...	...	83	...	193	...	18	100	...	...
Total Malay States	...	8,964	43,334	16,373	34,703	6,539	18,532	Nil	35	Nil	68	14,840	7,254	32,120	19,433	...	8,506	44,632	13	31
S. SETTLEMENTS :—																				
Malacca ...	...	1,435	2,345	887	1,915	507	948	Nil		Nil		1,825		4,678		...	1,619	2,343	...	...
Province Wellesley ...	...	1,691	1,041	328	742	107	264	Nil		Nil		6,748		11,831		...	924	1,053	...	...
Penang ...	2,216	4,152	18	13	31	58	108	3,672	8,551	6,030	19,641		Nil		Nil	1,996	3,618	14	...	...
Singapore ...	2,923	21,696	304	89	193	65	94	10,168		26,792		19,571		37,787		3,404	19,551	295	22	49
Labuan ...	...	23	Nil	Nil	Nil	8	18	49		116		Nil		Nil		...	13	Nil	...	...
Total Straits Settlements ...	5,139	28,997	3,708	1,317	2,881	745	1,432	13,889	8,551	32,938	19,641	28,244	Nil	54,296	Nil	5,400	25,725	3,705	22	49
Total Malaya ...	5,139	37,961	47,042	17,690	37,584	7,284	19,964	13,889	8,586	32,938	19,709	43,084	7,254	86,416	19,433	5,400	34,231	48,337	35	80

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Province We'sly D'dings M'cca.	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	4,720	18,792	3,375	2,350	1,841	133
WET RUBBER	654	759	243	224	414	98
TOTAL ...	5,374	19,551	3,618	2,574	2,255	231

TABLE III
FOREIGN EXPORTS

PORTS	For month	Jan.&Feb. 1939
29	30	31
Singapore ...	28,694	59,407
Penang ...	10,125	18,778
Port Swettenham.	4,050	7,883
Malacca ...	215	348
MALAYA ...	43,084	86,416

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	Jan.&Feb. 1939
32	33	34
Malay States ...	22,054	51,465
Straits Settlements	1,367	4,196
MALAYA ...	23,421	55,661

Notes:—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained
2. The production of estates of less than 100 acres is estimated from the formula: Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Columns (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S and F.M.S., at Singapore on 23rd March, 1939

METEOROLOGICAL SUMMARY, MALAYA, FEBRUARY, 1939.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes						Total.		Most in a day.	Number of days.					Total.	Daily Mean.	Per cent.
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						hrs.	hrs.	
Railway Hill, Kuala Lumpur, Selangor ...	90.1	70.7	80.4	95	66	82	75	83.0	84.0	4.59	116.6	2.17	9	7	3	2	—	169.60	6.06	51
Bukit Jeram, Selangor ...	89.3	71.2	80.3	92	69	84	73	84.7	85.7	3.89	98.8	3.46	7	5	—	—	—	216.50	7.73	64
Sitiawan, Perak ...	88.9	71.2	80.1	93	64	82	73	83.2	83.7	5.13	130.3	2.40	8	8	—	—	—	210.50	7.52	63
Ipoh Aerodrome, Perak ...	90.7	70.4	80.5	95	63	83	74	82.6	83.3	14.06	357.1	4.20	11	10	—	7	2	200.35	7.15	60
Temerloh, Pahang ...	87.0	70.7	78.9	91	67	80	74	83.6	84.7	1.51	38.4	0.30	13	10	—	8	—	170.40	6.09	51
Kuala Lipis, Pahang ...	85.9	70.2	78.1	89	66	82	73	82.2	83.0	5.70	144.8	2.34	14	10	2	19	1	133.75	4.78	40
Kuala Pahang, Pahang ...	82.9	74.3	78.6	85	70	79	79	81.5	82.9	12.88	327.2	4.13	14	14	—	—	—	153.15	5.47	45
Kallang Aerodrome, S'pore ...	86.7	73.6	80.1	89	71	82	76	81.0	82.3	6.33	160.8	1.87	14	11	1	—	—	180.30	6.44	53
Bayan Lepas Aerodrome Penang ...	87.7	72.0	79.9	92	65	81	74	83.1	83.7	6.76	171.7	4.25	9	6	4	—	—	219.75	7.85	66
Malacca Town, Malacca ...	87.1	72.8	79.9	91	70	80	75	81.3	82.3	2.01	51.1	0.91	9	7	1	—	—	190.50	6.80	56
Kluang, Johore ...	86.3	71.2	78.7	90	69	83	73	79.7	80.8	3.94	100.1	1.17	12	7	2	1	—	173.45	6.19	51
Mersing, Johore ...	82.4	74.3	78.3	86	68	80	77	79.6	79.6	3.57	90.7	1.30	11	9	—	—	—	170.30	6.08	50
Alor Star, Kedah ...	91.8	69.5	80.7	95	65	87	72	84.6	84.6	0.01	0.3	0.01	1	—	1	—	—	257.00	9.18	77
Kota Bahru, Kelantan ...	85.4	70.3	77.9	87	66	83	73	80.6	82.0	0.53	13.3	0.24	7	5	—	1	—	229.85	8.21	69
Kuala Trengganu, Trengganu	84.1	71.6	77.9	86	68	81	77	81.1	82.1	2.55	64.8	1.07	12	8	—	3	—	204.50	7.30	61
Labuan ...	83.9	75.7	79.8	87	73	80	78	85.7	86.3	2.84	72.1	1.83	6	5	—	—	—	187.30	6.69	56
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft.	68.6	59.8	64.2	73	57	64	62	69.4	70.1	6.06	153.9	1.62	17	14	—	23	2	114.65	4.09	34
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	71.0	54.3	62.7	75	40	67	60	68.2	68.4	4.76	120.9	1.21	14	11	—	3	5	141.10	5.04	42
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	71.0	57.0	64.0	76	52	65	59	*	*	4.94	125.5	1.33	13	13	—	—	5	147.35	5.26	44

* Not recorded.

Compiled from Returns supplied by the Meteorological Branch, Malaya.